Precalc Warm Up # 11-3

1) $3 + 5 + 7 + \ldots$

$S_{10} =$

2) $2 + 4 + 8 + 16 + \ldots$

$S_{10} =$

3) $16 + 12.8 + 10.24 + 8.192 + \ldots$

$S_{10} =$

4) $5 + 5.2 + 5.4 + \ldots$

$S_{10} =$

5. Which of the above can be evaluated for S_∞ ?

Evaluate it.

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EXERCISES 8.2.4

1. Evaluate:

(i) $27 + 9 + 3 + \frac{1}{3} + \ldots$ $1 \quad \frac{1}{3} + \cdots$

(ii) $1 - \frac{3}{10} + \frac{9}{100} - \frac{27}{1000} + \ldots$

(iii) $500 + 450 + 405 + 364.5 + \ldots$

(iv) $3 - 0.3 + 0.03 - 0.003 + 0.0003 - \ldots$

2. Use geometric series to express the recurring decimal 23.232323… as a mixed number.

$23.\overline{23}$

$23 + \frac{23}{100} + \frac{23}{10{,}000} \ldots$

$r = \frac{1}{100}$

4. Find the sum to infinity of the sequence 45, –30, 20, . . .

5. The second term of a geometric sequence is 12 while the sum to infinity is 64. Find the first three terms of this sequence.

$g_2 = 12$

$g_1 r = 12$

$g_1 = \frac{12}{r}$

$S_\infty = 64$

$\frac{64}{1} = \frac{g_1}{1-r}$

$64(1-r) = \frac{12}{r}$

6. Express the following as rational numbers

(a) $0.3\dot{6}$ (b) $0.\dot{3}\dot{7}$ (c) $2.1\dot{2}$

$0.3\overline{6}$

$2.1 + \underbrace{\frac{2}{100} + \frac{2}{1000} + \frac{2}{10,000} + \cdots}_{g_1}$

$0.3 + \underbrace{0.06 + 0.006 + 0.0006 + \ldots}_{S_\infty}$

$\frac{3}{10} + \underbrace{\frac{6}{100} + \frac{6}{1,000} + \frac{6}{10,000} + \cdots}_{r = \frac{1}{10}}$

$\frac{3}{10} + \frac{\frac{6}{100}}{1 - \frac{1}{10}}$

$\frac{3}{10} + \frac{\frac{6}{100}}{\frac{9}{10}}$

$\frac{3}{10} + \frac{6}{100} \cdot \frac{10}{9}$

$\frac{9}{30} + \frac{2}{30}$

$\frac{11}{30}$

7. A swinging pendulum covers 32 centimetres in its first swing, 24 cm on its second swing, 18 cm on its third swing and so on. What is the total distance this pendulum swings before coming to rest?

$r = \frac{3}{4}$

$32, 24, 18, \ldots$

$$S_\infty = \frac{32}{1 - \frac{3}{4}}$$

$$= \frac{32}{\frac{1}{4}}$$

$$= 128$$

9. Find the sum to infinity of the sequence $1 + \sqrt{3}, 1, \frac{1}{\sqrt{3}+1}, \ldots$

$$r = \frac{1}{1+\sqrt{3}}$$

$$S_\infty = \frac{1+\sqrt{3}}{1 - \frac{1}{1+\sqrt{3}}}$$ combine denom.

Combining denominator

$$\frac{1+\sqrt{3}}{1+\sqrt{3}} - \frac{1}{1+\sqrt{3}}$$

$$\frac{\sqrt{3}}{1+\sqrt{3}}$$

$$= \frac{1+\sqrt{3}}{1} \cdot \frac{1+\sqrt{3}}{\sqrt{3}}$$

$$= \frac{1 + 2\sqrt{3} + 3}{\sqrt{3}}$$

$$= \frac{4 + 2\sqrt{3}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$$

$2 \cdot \sqrt{3} \cdot \sqrt{3}$

$2 \cdot 3$

6

$$= \frac{6 + 4\sqrt{3}}{3}$$

10ai) $\sum_{i=0}^{n}(-t)^i$; $|t|<1$

$g_1 = 1$ $\quad r = -t$

$g_2 = -t$

$g_3 = (-t)^2$ $\quad S_n = \frac{1(1-(-t)^n)}{1-(-t)}$

$= \frac{1-(-t)^n}{1+t}$

ii) $S_\infty = \frac{1}{1-(-t)}$

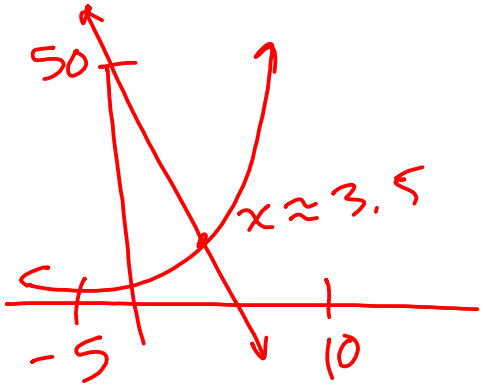
$= \frac{1}{1+t}$

Review Sigma Notation

$\sum_{i=3}^{17}(3-4i) =$ -555

Solve (nearest 10th):

$$2^x + 3 = 50 - 10x$$



HW: SL Book

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On #8, change it to a_n

Test Friday:

SL Chapter 8

Make sure you can solve equations by isolation, logarithms, and graphing.